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b) during comminution, injecting hot air into the soil to thermally strip off organic compounds, including natural and benign organic compounds, until such thermal stripping is no longer practically effective in further reducing the contaminant concentration level;

c) if, after the preceding step, the concentration level of the contaminant organic compound is above the target level, introducing a chemical oxidizing agent into the soil in an amount that is effective over reasonable time to reduce the contaminant concentration level to or below the target level.

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10. (Amended) A method as in claim 7, wherein the step of injecting hot air is continued until the concentration of the contaminant compound is reduced by more than fifty percent of its original level before introducing a chemical oxidizing agent into the soil.

REMARKS

The examiner had made a restriction requirement, which was traversed, and which she subsequently withdrew. Claims 1-12 are therefore still pending in the application and have been rejected by the Office Action.

Claim 10 has been rejected under 35 U.S.C. §112(2). Claims 1-5 and 7-11 have been rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent No. 4,834,194 to Manchak, Jr. [Manchak 194]. Claims 1-5 have been rejected under 35 U.S.C. §103(a) for being obvious over Manchak 194 in view of U.S. Pat. No. 4,844,807 to Manchak, Jr. [Manchak 807]. Claim 6 has been rejected for being obvious over Manchak 194 in view of Manchak 807 and U.S. Patent No. 5,190,405 to Vinegar [Vinegar]. Claims 7-11 have been rejected for being obvious over Manchak 194 in view of Manchak 807 and U.S. Patent No. 5,830,752 to Bruso [Broso]. Claim 12 has been rejected for being obvious over Manchak 194 in view of Manchak 807, Bruso and Vinegar.

Rejection under 35 U.S.C. § 112(2)

The amendment to claim 10 particularly points out that the recited concentration level of the soil contaminant is reduced by more than 50% of its original level before a chemical oxidant is introduced into the soil. This amendment unambiguously defines the concentration level as being reduced by more than 50% of the original soil contaminant

concentration before the step of introducing chemical oxidizing agents. Applicant respectfully requests this rejection be withdrawn.

Rejection under 35 U.S.C. §102(b)

The amendments to claims 3 and 7 obviate this rejection, which fails to state a *prima facie* case of anticipation. The MPEP §2131 states:

“ ‘[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described in a single prior art reference.’ *Verdegaal Bros. v. Union Oil Co. of CA*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). ‘The identical invention must be shown in as complete detail as is contained in the ...claim.’ *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).”

The anticipatory reference, Manchak 194, must recite all the elements as set forth in the claim and must disclose the same invention as contained in the claim. Manchak 194 does not do either.

The claims recite the element of injecting hot air into the soil to thermally strip organic compounds until such thermal stripping is no longer practically effective in further reducing the contaminant concentration level. This element is not expressly disclosed by Manchak 194.

Nor does Manchak 194 inherently disclose it. Manchak 194 discloses nothing about attaining a target contaminant concentration by thermal stripping using the injection of hot air into the soil until no longer practically effective for further reducing the contaminant concentration. Moreover, the mere fact that a certain step may result from a given set of circumstances or that a prior art reference may be modified to arrive at the invention does not sufficiently support an inherency argument. *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1269, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991), *quoting In re Oelrich*, 666 F.2d 578,581, 212 USPQ 323, 326 (C.C.P.A. 1981). An inherency rejection “must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.” *Continental Cal Co. v. Monsanto Co.*, 948 at 1268.

Manchak 194 does not even remotely suggest using the injection of hot air into the soil until no longer practically effective for further reducing the contaminant concentration.

In other words, Manchak 194 does not suggest the queried, stepwise process recited in the claims for analyzing whether the target concentration is reached: first, trying to reach a target contaminant concentration by using only the injection of hot air; and, then only after thermal stripping is no longer practically effective to reach the target concentration, using a chemical oxidant to attain the target. That is, the claims define a method whose steps have an order and in which a subsequent step may be omitted depending on whether the target concentration was achieved through the first step.

To the contrary, Manchak 194 allows for any sequence of decontamination steps, including using chemical oxidants first before the injection of hot air into the soil. “[The Manchak 194] treatment may consist of any combination of steps including the injection of additional hot air or steam for stripping of [sic] volatile contaminants, injections of treatment chemicals or biological treatment media, etc” (Manchak 194, col. 6, lines 8-12). Since Manchak 194 specifies no sequence of steps, it cannot logically disclose a queried set if steps comprising first a thermal stripping, which is only followed by the addition of chemical oxidants if the contaminant concentration has not reduced to the target level.

Manchak 194 cannot inherently specify the recited method because its invention aims, as the examiner acknowledges, only to detect soil contamination. In Manchak 194, contaminant reduction is a tangential afterthought. Manchak 194 does not contemplate a measured and responsive use of chemical oxidant to treat contaminated soil as the recited invention does. The claimed method has a built-in monitoring of the administration of chemical oxidants, which occurs as a query that determines whether chemical oxidants need be applied and, if so, only in an amount that effectively reduces the contaminant level to below the target level. Manchak 194 entirely lacks this queried step.

According to the *Verdegaal* and *Richardson* requirements in the MPEP, Manchak 194 must disclose the claim elements in the same detail as recited in the claim. Manchak 194 does not do this but discloses only the application of heat to the soil and the treatment of the soil with chemicals. It does not disclose the claimed detail of an analysis whether chemical oxidation of the soil is warranted nor suggests the application of only an efficacious amount of oxidant. Manchak 194 cannot inherently define all the claim elements since this reference never even implies a queried feedback or built-in analysis for reducing the ultimate effects of decontaminating soil waste using chemical oxidants. The anticipation rejection fails and Applicant respectfully requests its withdrawal.

Rejections under 35 U.S.C. 103(a)

Manchak 194 and Manchak 807 combination

The applicant appreciates the examiner's desire to speed the prosecution of the case by anticipating the applicant's arguments. However, to set forth a prima facie obviousness rejection using the combination of Manchak 194 and Manchak 807, the combination must teach or suggest all the claimed elements and also suggest a motivation for the combination from within the references (MPEP §2142).

The previous section points out that the claims define the decontamination method as a queried process of: first injecting hot air into the soil to thermally strip off organic compounds, which is continued until such thermal stripping is no longer practically effective in further reducing the contaminant concentration level; and next introducing a chemical oxidant if the contaminant concentration level following the first step is above the target level. As discussed above, Manchak 194 does not disclose or suggest this queried step.

Neither does Manchak 807. This reference discloses a variable, soil-detoxifying method that may include the administration of a chemical oxidant or biodegrading microorganisms to the soil (Manchak 807, col. 11, lines 50-58; col. 12, lines 29-44). The steps of the Manchak 807 method may be variable in that either jets of steam or a combination of steam and water can be used to create a soil slurry and release toxic vapors (col. 11, lines 1-10). To the soil slurry can be added chemical oxidants, which cause the toxic metals in the slurry to precipitate as water insoluble compounds (col. 11, line 63 to col. 12, line 3). After applying a dewatering agent, the slurry and precipitate become a hard impermeably-dense mass, which envelopes the remaining toxic substances and from which these substances will not leach (col. 12, lines 5-23). Moreover, one may skip the addition of chemical oxidants in favor of adding microorganisms that biodegrade the toxic waste (col. 12, lines 29-44).

The way of soil remediation in Manchak 807 is clearly not that of the claimed method. The Manchak 807 method creates impermeable clumps containing the toxic waste in an unleachable form and which may be continuously biodegraded by biological, and not chemical, action. The claimed method creates remediated soil that has had the organic contaminants vaporized off by the application of hot air and then also possibly neutralized

by the addition of a priorly-determined minimum amount of chemical oxidant. Pre-determining the amount of chemical oxidant lessens the amount of unwanted by-products in the soil. The Manchak 807 method does not disclose the queried step of whether to add chemical oxidants to the soil. Indeed, it can avoid altogether the consideration of adding chemical oxidants to the soil by adding biological agents instead. The Manchak 807 reference discloses even fewer of the claimed elements than Manchak 194 does.

The combination of Manchak 807 and Manchak 194 is even less likely to suggest the claimed method than Manchak 194 alone. Together these references emphatically teach a generality in the steps of remediating soil contamination and a variability in their sequence. Variability in the sequence of soil remediation actually teaches away from the claimed method, which is stepwise and queried and analyzes whether the addition of chemical oxidants to the soil is necessary and, if so, guides the amount added. The Manchak 807 and 194 combination does not disclose the claimed elements. It actually teaches away from the claimed method and for that reason cannot suggest a motivation for the combination arising from within the references themselves. Applicant respectfully requests the obviousness rejection for claims 1-5 be withdrawn.

Other Combinations Cited

None of the other allegedly obvious combinations that include Vinegar or Bruso suggests or discloses this queried step. In relying on the Manchak 194-Manchak 807 combination, these other combinations suffer from the same shortcomings as discussed above. Namely, none of these recites the claimed elements in the detail as claimed; they actually teach away from the claimed invention; and no combination suggests a motivation for the combination from within the references themselves. Applicant requests the withdrawal of the obviousness rejections of claims 6-12.

Conclusion

The claims now being in condition for allowance, Applicant respectfully asks for an early notice of allowance.

Respectfully submitted,

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APPENDIX A: Version Showing Changes To The Claims

As required by 37 C.F.R. 1.21(c) (ii), provided hereinbelow is a marked-up version of the claims amended in this response:

3. (Amended) A method [as in claim 1] of soil remediation to reduce the concentration level of a contaminant organic compound in soil to a target concentration level, comprising, in sequence, the steps of:

a) churning the soil with a soil mixing device;

b) injecting hot air into the soil as it is being churned to thermally strip off organic compounds, including natural and benign organic compounds;

wherein the step of injecting hot air into the soil as it is being churned to thermally strip organic compounds is continued until such thermal stripping is no longer practically effective in further reducing the contaminant concentration level; and

c) if the contaminant organic compound concentration level following the preceding step is above the target level, introducing a chemical oxidizing agent into the soil in an amount that is effective over reasonable time to reduce the contaminant concentration level to or below the target level.

5. (Amended) A method as in claim [1] 3, comprising the step of preheating the soil with a ground heater system prior to introducing the chemical oxidizing agent.

6. (Amended) A method as in claim [1] 3, comprising the additional step of covering the soil with thermal insulation after introducing the chemical oxidizing agent.

7. (Amended) A method of in situ soil remediation to reduce the concentration level of a contaminant organic compound in soil to a target concentration level, comprising, in sequence, the steps of:

a) comminuting the soil in situ with a trenching tool;

b) injecting hot air into the soil as it is being comminuted in situ to thermally strip off organic compounds, including natural and benign organic compounds,

wherein the step of injecting hot air into the soil as it is being comminuted in situ to thermally strip organic compounds is continued until such thermal stripping is no longer practically effective in further reducing the contaminant concentration level.

c) if the contaminant organic compound concentration level following the preceding step is above the target level, introducing a chemical oxidizing agent into the soil in an amount that is effective over reasonable time to reduce the contaminant concentration level to or below the target level.

10. (Amended) A method as in claim 7, wherein the step of injecting hot air is continued until the contaminant concentration is reduced by more than fifty percent of its original level before introducing a chemical oxidizing agent into the soil.